Rice University

Department of Chemical and Biomolecular Engineering

CHBE 343 CHEMICAL ENGINEERING LAB I

Course Syllabus Spring 2019

Class schedule and location

Lectures:

Monday - 4:00 to 5:30 pm in HRZ 212/ Abercrombie Lab B146C

Experimental Sessions:

1:00 to 4:00 am in B114 Abercrombie Lab - Monday

2:00 to 5:00 am in B114 Abercrombie Lab - Wednesday

Schedule- Spring 2019.pdf

Instructors

Dr. Rocio H. Doherty

Lecturer

Email: rdoherty@rice.edu

Office hours

Monday 4:00 - 5:30 pm

Abercrombie Lab B146C

Jacob Arredondo

Lab Manager

Email: jha1@rice.edu

Office hours

By appointment

Abercrombie Lab B114

Support Team

Jinxin Lu (jl181@rice.edu) - Experiment 1

Bo Wang (bw23@rice.edu) - Experiment 2

Chutian Bai (cb51@rice.edu) - Experiment 3

Yousef Khalil (ytk1@rice.edu) - Experiment 4

Prerequisites:

CHBE 390, CHBE 401, CHBE 411

Co-requisites:

CHBE 350

Course description

This course reinforces fundamental principles taught in prerequisite courses through hands-on experience in the design and execution of experiments with emphasis on process scaling, instrumentation, experimental design, and technical writing.

Course objectives

- Demonstrate technical knowledge by formulating solutions to experimental problems and analyzing experimental data.
- Demonstrate the ability to design and execute experiments and analyze and interpret experimental results.
- Demonstrate the ability to design/scale-up equipment from laboratory data.
- Demonstrate the ability to identify, formulate, and solve engineering problems.
- Demonstrate knowledge of the impact of engineering on society.
- Demonstrate the ability to communicate effectively, using written and verbal formats.
- Demonstrate the ability to engage in lifelong learning.

ABET outcomes:

- SO 5 An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive work environment, establish goals, plan tasks, and meet objectives.
- SO 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Textbook

- Rocio H. Doherty, *Lecture Notes for Chemical Engineering Lab I: Spring 2019 Edition - Canvas, Modules Section.*
- Michael Alley, *The Craft of Scientific Writing, Springer* (1996) 3rd Edition ISBN- 0-387-94766-3

- Michael Alley, *The Craft of Scietific Presentations* (2013) 2nd Edition ISBN- 978-1-4419-8278-0

References

- Gregory S. Patience, *Experimental Methods & Instrumentation for Chemical Engineers*, 1st Edition, El Sevier (2013), ISBN-13: 978- 0444538048
- Lucile Vaughan Payne, *The Lively Art of Writing*, Signet (1969), ISBN-13: 978-0451627124
- Jack P. Holman, *Experimental Methods for Engineers,* Seventh Edition, McGraw-Hill (2000)
- Howard M. Kanare, *Writing the Laboratory Notebook,* American Chemical Society (1985)

Academic integrity

Students are required to review and abide by the *Rice Honor Code*, which can be found at honor.rice.edu. It is the instructor's understanding and expectation that the student's signature on any test or assignment means that the student contributed to the assignment individually or as a team member and that he or she neither gave nor received unauthorized aid. All laboratory reports are treated the same as pledged exams. You may not consult with members of other teams in any way about your reports. You may not receive help from anyone outside of your team with the exception of the instructor and the TA's. You may not consult lab reports from previous CHBE lab courses. Failure to comply with this policy will be immediately reported to the Honor Council for further actions. This policy will be strictly enforced.

Safety Regulations

You must wear the following Personal Protective Equipment (PPE) at all times while in the lab (**no exceptions**)

- Safety glasses/goggles
- Long sleeve laboratory coat
- Clothing that fully covers yourself to the ankle (pants are best)
- Closed-toe shoes with backs (full coverage shoes are best, high heels are prohibited)

Based on the experiment or procedure, additional PPE such as gloves may be required. Laboratory gloves should only be worn inside the laboratory.

Students will not be allowed to work the lab if they fail to meet these safety regulations

A more detailed and comprehensive discussion of safety requirements can be found in the safety manual located in the modules section of Canvas. All students are required to read and be familiar with these requirements.

Attendance

Attendance to class and experimental sessions is mandatory and lateness is not acceptable. In the case of the experimental sessions, there is a tolerance window of 5 minutes. Students are not allowed to leave the class/experimental session once it has started.

Missing a class/experimental session will be counted as an absence, the only exception is a previous commitment with a Rice sports team. If this is the case, the student should bring a note signed by the coach, specifying the date and time of the game. If any extenuating circumstances prevent your attendance, you are expected to notify the instructor by email in advance. If you do not receive a return email confirming the agreement, you must contact the instructor by other means. If medical or other circumstance makes advance notification impossible, you are expected to submit justification for your absence in writing. Those excused from class are still responsible for all lecture materials and lab reports.

Students are required to sign an attendance sheet prior to the end of each class session. This attendance sheet is governed by the Rice honor code policy.

Each unexcused absence will result in a loss of five (5) percent of the total course grade. Three or more unexcused absences will lead to a failing grade in the course.

Reports

Reports will be due at the beginning of the class a week after the experiment was performed. **Reports will not be accepted if they are turned in at a different day/time or by email**. Any regrading request must be done within one week after the report was returned. In this case, no specific sections but the full report will be regraded.

Quizzes

A pre-lab quiz will be applied at the beginning of each experimental session. The quiz will contain important information about the procedure along with questions related to the safety of that particular experiment (4-5 questions per quiz.) The students will have to answer correctly to at least 3 of them, otherwise, s/he will be asked to leave the lab and a grade of zero will be assigned to that particular experiment. The grade obtained in the quiz will be also taken into account in the final grade. S/he will be allowed to contribute to the experimental report based on the information provided by the rest of the team.

Grading policy

Attendance to lectures	10%
Quizzes	20%
Participation in the experimental sessions	10%
Reports	50%
Poster presentation	10%

The final letter grade is determined as follows: